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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/072,412 05/04/98 SCHWARTZ

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LM02/0829

EXAMINER

PENDLETON, B

ART UNIT

PAPER NUMBER

2747

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Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary	Application No.	Applicant(s)	
	09/072,412	SCHWARTZ, STEPHEN R.	
	Examiner Brian T. Pendleton	Art Unit 2747	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).

Status

- 1) Responsive to communication(s) filed on 05 June 2000.
- 2a) This action is FINAL. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-27 is/are pending in the application.
- 4a) Of the above claim(s) 26 is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 1-25, 27 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claims _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on _____ is/are objected to by the Examiner.
- 11) The proposed drawing correction filed on _____ is: a) approved b) disapproved.
- 12) The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

- 13) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
- a) All b) Some * c) None of the CERTIFIED copies of the priority documents have been:
1. received.
2. received in Application No. (Series Code / Serial Number) _____ .
3. received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) Acknowledgement is made of a claim for domestic priority under 35 U.S.C. & 119(e).

Attachment(s)

- | | |
|---|--|
| 15) <input type="checkbox"/> Notice of References Cited (PTO-892) | 18) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 16) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 19) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 17) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ . | 20) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

Applicant's arguments filed 6/5/2000 have been fully considered but they are not persuasive. Applicant has not persuaded Examiner of the allowability of claims 25 and 27 over the cited reference of record, Menkhoff, US Patent 5,714,918. With respect to claims 19, 20 and 23, the prior 112 2nd paragraph rejection still stands. Applicant is claiming "...averaged digital filter algorithm..." Such a statement is vague for the following reason: As stated in the prior Office Action, **algorithms cannot be averaged**. According to Merriam-Webster's Collegiate Dictionary, tenth edition, the definition of a algorithm is a "a procedure for solving a mathematical problem in a finite number of steps that frequently involves repetition of an operating; *broadly* : a step-by-step procedure for solving a problem..." Therefore one cannot average a procedure for solving a mathematical problem. The values resulting from two different algorithms can be averaged. In addition, an algorithm can be described as an "averaging algorithm". However, these two examples are not claimed by the Applicant, therefore the claim language is determined to be indefinite. Regarding the Olden rejection to claims 1-5. Although Olden does not mention an acoustic instrument, *it is the teaching which is the basis for the rejection*. Hence, the need for a 103(a) rejection, where by the Examiner makes an obviousness assessment according to the teachings of a reference. Specifically, Olden teaches changing the characteristics of an equalizer to equate the signal heard in a listening environment to the signal produced at the sound source. It is that teaching which is relied upon. See below. Regarding Miller et al and the rejections

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to claims 6, 13, 16, and 21, Applicant has asserted that Miller et al do not show or suggest comparing first and second audio recordings and designing an equalizer based on the differences. Once again, that issued was addressed in a 103(a) rejection, not 35 U.S.C. 102, where the Examiner is empowered with the determination of obviousness. Miller et al teach having a reference signal and a audio signal from an instrument and adjusting an equalizer as a result of the difference. The teachings in both Miller et al and Olden are directed to changing or modifying a filter as a result of comparing two different signals. Examiner is not convinced that the claimed invention is patentably distinct from this broad teaching. There is no appreciable difference between the references and the claimed invention. The only difference lies in the method of collecting the reference signals and the sound signals from an instrument, however, this method of collection does not give unexpected results over results of the references. Applicant is calling the invention a "Tailor-Made Equalizer", however, according the teachings of the two references, equalizers have been tailored for a specific frequency response for a substantial amount of time.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 19, 20, 23 and 24 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Based on claim 16 written in proper

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form, claim 19 attempts to further limit claim 16 by stating "...averaging the first and second digital filter algorithms." This language is vague. Algorithms cannot be averaged as they represent procedures. Furthermore, claim 19 does not show the importance or advantage of such a limitation and how it relates to the invention. Accordingly, claim 20 uses an "averaged" algorithm and is therefore vague. In addition, claim 23 also recites "...average digital filter algorithms...", which cannot be accomplished since algorithms are procedures. Also, claim 24 recites "...digital signal processor coupled to said third microphone and adapted to apply said digital filter algorithms averaged by said processor...". Once again, algorithms cannot be averaged by any type of processor.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

Claims 25 and 27 are rejected under 35 U.S.C. 102(e) as being clearly anticipated by Menhkoff, US Patent 5,714,918. See figure 6, TP=low pass filter, HP=high pass filter, control unit.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

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invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Olden. Olden discloses an audio equalizer 46 which is set up using acoustic microphone 38 in the listening area, and audio source 26. As taught in column 5 line 11 – column 6 line 13, the signal picked up by microphone 38 is equalized to the audio source 26. It would have been obvious to one of ordinary skill in the art at the time of the invention to apply the equalizing method to instruments. In column 3 lines 35-36, Olden suggests that the audio source can comprise a cassette tape, tuner, etc. One of ordinary skill would have realized that the audio source could be an instrument. The audio signal would come from a microphone attached to the instrument (per claim 2), as admitted such an apparatus is used in the art (page 4 second paragraph). As a result of making the audio source an acoustic instrument, the sound produced by the instrument (after the source 26) can be compared with the reference sound, which is the sound picked up by microphone 38 in an optimal setting and the equalizer 46 can be set to equate those signals. Whether playing the instrument separately to produce the audio signal and the reference signal or using the automatic method of Olden, the teaching of modifying an equalizer is relied upon. One would have been motivated to use the method of Olden for instruments since their performance can be affected by a listening environment (see column 1 lines 36-40), and to achieve high fidelity, an equalizer must be used to equate the sound heard by a listener positioned in an area and the audio sound from an instrument. Per claims 3 and 4, Olden teaches that a spectrum analyzer is used to compare a reference signal with a signal picked up by a microphone in the

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listening area (column 1 lines 55-68). The results of the analyzer is used to equalize the system. Since a spectrum analyzer represents a quantitative method for equalizing, it would have been obvious to also use a qualitative method such as listening. Per claim 5, Examiner takes official notice that adjustment ranges are determined for any type of electrical device. A trial-and-error approach is often carried out to determine the optimal adjustment range of a device, whether it be an instrument or an audio source, such as a CD player, etc to make the sound more pleasing to the listener. One example is the volume control on a stereo, which has an adjustment range set by the manufacturer. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to determine adjustment ranges based on the response of different instruments of the same type.

Claims 1, 16-18, 21-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miller et al, US Patent 5,506,910. Miller et al disclose a musical instrument 26, microphone 28, automatic equalizer 20, speaker 36, and reference microphone 40. As disclosed in column 3 lines 32-60, the reference microphone 40 picks up sounds made by an instrument and the sine wave adder 22 and adjusts the multi-band gain control 32 to produce a desired frequency response. It would have been obvious to one of ordinary skill in the art at the time of the invention to use the automatic equalizer to equalize the signal from the musical instrument 26 to a desired frequency response, the desired response being the natural sound played by the instrument. The response of the natural sound could be generated by manipulating the sine wave adder 22 accordingly. It was well known that instruments do not sound

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natural during amplification, the solution occurring in the form of an equalizer. Since Miller et al teaches that an equalizer can be used to generate a desired response with instruments and a listening environment, one would have been motivated to use their system to generate a response which is the natural sound of the instrument. As to claims 16 and 18, there are two microphones 28 and 40, and processor 86 (figure 4). For the same reason above, it would have been obvious to make the filter algorithm equate the signals from the first and second microphones and apply it to the signal from the first microphone. One would have been motivated to create a digital algorithm since such algorithms are quicker and more efficient than using analog circuitry. This algorithm could be performed for different sounds (claim 17). Per claims 21 and 22, there is disclosed a first microphone 28, second microphone 40, and equalizer 20, which has a digital processor 86.

Claims 6-11 and 13-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miller et al. As discussed above, Miller et al discloses a musical instrument 26, microphone 28, automatic equalizer 20, and second microphone 40. It would have been obvious to set the equalizer to equalize the audio sound with a "natural" sound of a musical instrument. The difference between claim 6 and claim 1 is that the comparison is done on audio recordings. However, this step is not determined patentably distinct over the prior art. The step of recording and comparing recordings accomplishes the same task as the dynamic comparison, therefore, it would have been an obvious design choice to one of ordinary skill in the art, meeting claim 6. As to claims 7 and 14, it would have been obvious to place the microphone on the instrument

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(page 4 second paragraph). Per claims 8 and 9, Miller et al teaches that the microphone is positioned in a room where the listener would listen to the audio. Regarding claim 10, Examiner takes official notice that adjustment ranges are determined for any type of electrical device. A trial-and-error approach is often carried out to determine the optimal adjustment range of a device, whether it be an instrument or an audio source, such as a CD player, etc to make the sound more pleasing to the listener. One example is the volume control on a stereo, which has an adjustment range set by the manufacturer. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to determine adjustment ranges based on the response of different instruments of the same type. Per claim 11, figure 5 shows two separate tracks and two separate equalizers. As to claim 13, an automatic equalizer inherently has filter circuits and gain controls to equalize a signal with a desired signal. As to claim 15, the equalizer is Miller et al is digital.

Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Miller et al in view of Hagimori et al, US Patent 5,537,614. Miller et al meet the limitations of claim 6 as explained above. However, Miller et al does not disclose that the first and second audio recordings are displayed and equalization is based on the display. Hagimori et al disclose a signal display unit. One of ordinary skill in the art would have realized that a display unit such as the one described by Hagimori et al can be used to display waveforms and compare them. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to Hagimori et al's display unit and set the equalizer according to the results of the displayed signals. This method

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accomplishes the same task as sending the signals to a spectrum analyzer, which is taught by Miller et al.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian T. Pendleton whose telephone number is (703) 305-9509. The examiner can normally be reached on M-F 7-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Forester W. Isen can be reached on (703) 305-4386. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 305-9508 for regular communications and (703) 308-5403 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3900.



FORESTER W. ISEN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2700

btp
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